North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Health Science

B. Discipline: Radiological Sciences

C. Course Number and Title: RADS 1270 Radiographic Image Quality

D. Assistant Dean: Heidi Kreglow, PT

E. Credit Hours: 1.5
Lecture: 1
Laboratory: 0.5

F. Prerequisites: RADS 1170, RADS 1175
Co-Requisites: RADS 1221m, RADS 1251m

G. Last Course/Curriculum Revision Date: Spring 2024 Origin date: Fall 2025

H. Textbook(s) Title:

Principles of Radiographic Imaging
(Purchased in RADS 1270)
- Author: Carlton, Adler and Balac
- Copyright Year: 2020
- Edition: 6th
- ISBN: 9781337711067

Bushong's Radiologic Science for Technologists: Physics, Biology, and Protection
(Purchased in RADS 1270)
- Author: Stewart Bushong
- Copyright Year: 2025
- Edition: 13th
- ISBN: 9780323765367

RadTechBootCamp - Clover Learning Student Plan, electronic resource
(Purchased in RADS 1151)
- Vendor: Clover Learning Inc.
- Copyright Year: 2023
- Edition: n/a
- ISBN: 9781951294038

I. Workbook(s) and/or Lab Manual: None

J. Course Description: This course is designed to establish a foundation in the principles that govern the production of diagnostically valuable images. This course content establishes a knowledge base of factors that control and influence the recording of quality radiographic images. Image analysis is included with the importance of optimal imaging standards. The lab setting will permit application of these skills.

K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Identify prime factors that govern the image production process in radiography.	Discussion, completed assignments, lab experiments with worksheets Weeks 1, test Week 2, comprehensive final Week 8
2. Evaluate the effects of beam restriction, patient factors and ancillary devices on image quality.	Discussion, completed note packets, educational software assignments, lab experiments with worksheets Weeks 2-3, test Week 4, comprehensive final Week 8
3. Identify, compare and contrast photographic properties that affect visibility of detail on image quality.	Discussion, completed note packets, educational software assignments, lab experiments with worksheets Weeks 3-4, test Week 5, Comprehensive final Week 8
4. Demonstrate and evaluate the geometric properties that affect recognizability of structures and control detail on image quality.	Discussion, completed note packets, educational software assignments, lab experiments with worksheets Weeks 5-6, test Week 7, comprehensive final Week 8
5. Compare and contrast the manipulation of exposure factors using various phantoms to produce a diagnostically valuable image.	Lab experiments and analysis Weeks 2-8
6. Use effective oral, written and nonverbal communications skills.	Class discussions, testing and analysis discussions of lab experiments and observations Weeks 1-8

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00-59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Health Sciences	**Discipline:**	Radiological Sciences
Course Coordinator:	Heidi Chambers		
Course Number:	RADS-1270	**Course Title:**	Radiographic Image Quality
Semester / Session:	Spring 2026 / Session A	**Start / End Date:**	1/12/2026 thru 5/8/2026

Instructor Information

Name:	Heidi Chambers	**Credentials:**	BRST, R.T. (R)
Phone Number:	419/755-4809	**E-Mail Address:**	hchambers@ncstatecollege.edu
Office Location:	Health Sciences 152	**Office Hours:**	By appointment; in person or via Zoom Wed 11a-12p and 4p-5p; Thurs 10a-12p and 4p-5p

I. Topical Timeline / Course Calendar (Subject to Change):

Weeks	Topics	Assignment	Due Date
1	Prime Factors Vision and Perception	CN 1 Note Packet CN 2 Note Packet RTBC → Prime Factors (mAs, 15% rule, Direct Square Law, Indirect Square Law) Live Zoom Class In person Lab Experiments/Worksheets	Jan 13 Jan 13 Jan 14 Jan 14 Jan 14
2	Beam Restriction/Collimation and Scatter The Patient as a Beam Emitter	CN 3 Note Packet CN 4 Note Packet RTBC → Collimation Live Zoom Class In person Lab Experiments/Worksheets	Jan 20 Jan 20 Jan 21 Jan 21 Jan 21
3	Grids	CN 5 Note Packet RTBC→ Grids (intro, types, errors, conversions) **Test 1 (CN 1 & 2) /** Live Zoom Class In person Lab Experiments/Worksheets	Jan 27 Jan 28 Jan 28 Jan 28
4	Image Receptor Exposure Contrast Supplement Material for CN 6-9: Digital Radiographic Technique (Bushong Ch. 14)	CN 6 Note Packet CN 7 Note Packet RTBC → Receptor Exposure (I and II) RTBC → Contrast (intro, procedural factors, subject contrast, digital factors) **Test 2 (CN 3 &4)** /Live Zoom Class In person Lab Experiments/Worksheets	Feb 3 Feb 3 Feb 4 Feb 4 Feb 4 Feb 4
5	Spatial Resolution Supplement Material for CN 6-9: Digital Radiographic Technique (Bushong Ch. 14)	CN 8 Note Packet RTBC→ spatial resolution (overview, beam geometry, digital image factors, digital display factors) **Test 3 (CN 5) /** Live Zoom Class In person Lab Experiments/Worksheets	Feb 10 Feb 10 Feb 11 Feb 11
6	Radiographic Distortion Supplement Material for CN 6-9: Digital Radiographic Technique (Bushong Ch. 14)	CN 9 Note Packet RTBC → Magnification and Distortion **Test 4 (CN 6 & 7)** /Live Zoom Class In person Lab Experiments/Worksheets	Feb 17 Feb 17 Feb 18 Feb 18
7	Exam and Review	**Test 5 (CN 8 & 9)** / Live Zoom Class In person Lab Experiments/Worksheets	Feb 25 Feb 25
8	Final Examination	**Comprehensive Final (CN 1-9)** **In Person-On Campus**	 Mar 4
The instructor reserves the right to modify this calendar. All assignments, tests and dates are subject to change.			

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Class Assignments and Attendance			10 %
• Note packet assignments	9 x 20	180	
• RTBC video lessons and quizzes		Vary	
• Other graded items/worksheets		Vary	
• Attendance	8 x 10	80	
Lab Assignments and Attendance			10 %
• Experiments /Worksheets		Vary	
• Lab Attendance	7 x 5	35	
Exams	5	Vary	60 %
Final Exam	1		20 %

Note: Minimum Course Grade
The Radiological Department believes that a grade below C+ indicates a lack of mastery of essential skills. Therefore, any student who receives less than C+ in any Radiological Science sequence course cannot continue in the Radiology Program.

III. Class Attendance, Lab Attendance and Homework Make-Up Policy:

1. **Class Attendance Requirements**: Students are expected to attend ALL scheduled live online Zoom lectures, which are necessary to acquire the knowledge required to be successful in the course. Classes will meet once a week with a link to the class provided in the Canvas course.

2. **Class Attendance Grading:** Attendance is recorded and factored into the final course grade.
    - **Present**: Joining the session at or before the scheduled start time and remaining until the scheduled end time (10 points).
    - **Late:** Joining the session one minute after the scheduled start time OR leaving the session before the scheduled end time (5 points).
    - **Absent:** Joining the session 15 minutes or more after the scheduled start time OR leaving 15 minutes or more before the scheduled end time OR not returning after scheduled breaks/exams. (0 points).

3. **Lab Attendance Requirements:** Students are expected to attend ALL scheduled labs which is necessary for hands on skills application of class material. Labs will meet once a week, in person and on campus. Students are also expected to wear properly fitted lab attire (black scrub top with undershirt and black scrub pants)

4. **Lab Attendance Grading:** Attendance along with proper lab attire is recorded and factored into the final course grade.
    - **Present and Properly Dressed**: Arriving to lab at or before the scheduled start time, remaining until the scheduled end time, and wearing proper lab attire. (5 points).
    - **Late and/or Not Properly Dressed:** Arriving to lab one minute after the scheduled start time, leaving before the scheduled end time OR not wearing the proper lab attire. (2.5 points).
    - **Absent:** Unexcused absence, arriving15 minutes or more after the scheduled start time, OR leaving 15 minutes or more before the scheduled end time. (0 points).

5. **Notification Requirements:** In any circumstance where a student will miss an online class or in-person lab, the student must send a message to the instructor through Canvas **prior** to the start of the class or lab. If a student is absent from the online class due to illness, the student is not permitted to attend lab for that day. If the student is absent from the online class without notification to the instructor, the student is not permitted to attend lab for that day.

6. **Excused Absences:** The reasons for which a student may be excused from class or lab without a deduction are as follows:
    a. Hospitalization (with documented verification)
    b. Death in the immediate family (with documented verification)
    c. Personal illness or illness in immediate family - (doctor's excuse required).

7. **Technical Difficulties:** Technical issues should be communicated to the instructor as soon as possible, preferably before class via Canvas message or email. However, technical issues will not be accepted as an excused reason for tardiness or absence. Students experiencing persistent issues should contact the IT help desk immediately at helpdesk@ncstatecollege.edu or 419-755-4737.

8. **Attendance Make-Up Policy**: students marked absent or late are not eligible for full participation points for that session or lab. Recoded sessions (when available) do not substitute for attendance and participation.

9. **Homework and Other Assignments:**
   - Completed, on time submissions receive full credit only when submitted by the due date and time.
   - Late assignments receive a 50% deduction.
   - Submissions one minute past the due date and time are considered late.
   - Assignments are accepted up to 7 days after the original due date for partial credit
   - Assignment submission after 7 days will receive a score of zero (0).
   - Missing assignments will receive a score of zero (0).
   - Technology issues are not an excuse for late submission and are subject to the late assignment deduction.
   - It is the student's responsibility to follow submission due dates and times.

10. **Academic Integrity:** All homework assignments, presentations, written assignments and projects must reflect the student's own work. Copying other students work or using AI tools (i.e., Chat GPT or other generative AI software) to complete an assignment is prohibited**.** AI tools may only be used when explicitly stated by the instructor for specific assignments. Work found to be completed by copying or with unauthorized AI assistance will be considered a violation of academic integrity and may be subjected to disciplinary actions and/or the college's misconduct process.

IV. Examination Policy:

1. **Test Attendance Requirements:** Students must attend class when tests, oral presentations, and written assignments are scheduled. If the student does not attend class on these days the following deductions will be applied:
   - 1st missed test → 10% deduction from the earned score
   - 2nd missed test → 15% deduction from the earned score
   - 3rd missed test → 20% deduction from the earned score
   - Additional missed tests → result in a zero score

2. **Late Arrival**: A student who arrives late to class for a test for any reason may not be permitted to take the test at that time. The test will be treated as a make-up exam with appropriate deduction from the earned score:
   - Late arrival for any exam → 10% deduction from the earned score

3. **Excused Absences**: The reasons for which a student may be excused from taking an examination, oral presentations, and assignments and not receive a deduction in score are as follows:
   - Hospitalization (with documented verification)
   - Death in the immediate family (with documented verification)
   - Personal illness or illness in immediate family - (doctor's excuse required).

4. **Make Up Exam Procedure:** Any student who misses an examination (for any reason) is responsible for contacting the instructor prior to the start of class or examination through Canvas to let the instructor know the reason of absence and schedule the make-up test. Make-up exams are scheduled as close as possible to the missed test date and should occur no later than one week from the missed exam. In cases of **extreme** illness or hospitalization contact should be made no later than 24 hours from the date of absence. If the student does not contact the instructor within the allotted time, the student may be subjected to a zero on the examination. The instructor will not "chase down" the student to reschedule.

5. No makeup opportunity will be given for absences of unscheduled quizzes (pop quizzes).

6. **Exam Administration:** Exams are administered via the Canvas course and are proctored over Zoom. The student must use two devices (phone and computer) while faculty proctor the examination. Each exam creates a real-time log of the student's activities while in the exam. Navigation away from the exam tab during the examination is not permitted for any reason. Exam logs are randomly checked by faculty after each test. Any student who navigates

one time from the exam will receive a zero and a written warning. If a student navigates from the exam more than once, the student will receive a zero on the test and subjected to the college's academic misconduct process.

7. **Academic Support**: Any student who scores below a 77% on any examination is **required** to schedule a one on one meeting with the instructor to identify knowledge gaps of the material where tutoring may be mandated. Students who fail to schedule this required meeting will receive a 10% deduction from their final score until the meeting has been scheduled and attended. The meeting should be scheduled as close as possible post examination. The student should not view this as punishment but as a benefit to be as successful as they can be in the program.

V. Classroom Expectations:

1. **Hybrid Course Delivery Guidelines:** Since this is a hybrid course, part of the course content is delivered outside of the classroom and in your home. It is expected that you have a designated learning space in your home or other outside classroom accommodations. **This space should be free of distractions (i.e., pets, children, siblings, parents, significant others, music, and television). You will not be permitted to attend to these distractors during class or during at test**. In this space, you will have adequate lighting, an area to sit upright, all electronic devices needed, textbooks, and note assignments.

2. **Zoom Lectures:**
   During online class lectures, the student will:
   - Be appropriately dressed, sitting upright (preferably at a table or desk), with the camera on unless otherwise instructed
   - Take care of personal needs (restroom) prior to the beginning of the class
   - Remove all distractors from the Zoom area
   - Mute your mic, unless answering or asking questions
   - Use the raise hand feature to ask questions or get the instructors attention
   - Complete the required weekly content prior to class (i.e., reading assignments, homework assignments)
   - Be prepared to participate in class (ask and answer questions)
   - Have the required material on hand at the time of class (i.e., note packets, textbooks, etc.)
   - Review the day's material or complete other assignments as the student waits for others to finish a test or in class assignment
   - Stay on task when given in class activities and group assignments

3. Demonstrate professional oral and written communication (emails, class discussion, group activities)

4. Unless otherwise instructed, cell phone use is not permitted in hybrid courses or in person labs. If a student has their cellphone out distracting others or the instructor, the student will pay a donation of $1.00 to the Robert L. Garber scholarship fund. Examples (but not a complete list) of cell phone distractors are as follows:
   - Texting
   - Cell phone ringing or vibrating loudly
   - Answering and conversing over the phone
   - Watching videos

5. Treat classmates and instructors with respect at all times

6. Use course resources wisely. Examples include:
   - Assigned reading material
   - Recorded lectures, notes, and power points
   - Practice quizzes
   - Rad Tech Boot Camp (RTBC)
   - Worksheets
   - Group activities
   - Class discussion
   - Tutoring
   - Review of prior exams
   - Instructor office hours